The brain consists of two temporal lobes, situated prominently on both sides of the brain-mirrored across the sagittal plane. These lobes sit in the middle of our cranial fossa, which are interior skeletal depressions to support the temporal lobes. Our ears are situated parallel to our cranial fossa. Continuing with the temporal lobe, it is accepted that these lobes assist with 8 different cognitive functions, such as Speech perception and production, hearing, episodic memory, phonological understandings, social and visual encoding, and finally semantic memory (Patel et al., 2025).

The Medial Temporal Lobe (MTL) sits deeper within the temporal lobes, closer to the brain's midline (the sagittal plane) (Baars & Gage, 2018). The structures found within the MTL are understood to be our hippocampus, amygdala, perirhinal cortex, parahippocampal cortex, and finally the entorhinal cortex (Raslau et al., 2015). These structures are integral for the formation, storage, and retrieval of our memories. The complex circuitry of our MTL helps with the formation of episodic memories, and with the help of the hippocampus, allows us to encode, organize, and formulate a structure to our memories (Dickerson & Eichenbaum, 2010). Due to the intricacies and density of neural tissues found within the MTL, our MTL not only assists with long-term memory storage but also assists with other memory functions such as working memory. This could be due to the temporal lobe's neural highway connections with other cortical lobes.

In terms of working memory, our prefrontal cortex (PFC) is believed to be responsible for this higher cognitive function (Funahashi, 2017). The prefrontal cortex is situated in the front of the brain, right behind the forehead and above the eyes. This cortex can be divided into two regions, the dorsolateral prefrontal cortex and ventrolateral prefrontal cortex (Hathaway &

Newton, 2025). Recent studies have found that lesions within the dorsolateral PFC inhibit the efficiency of working memory. The dorsolateral PFC is located on the outer (dorsal) surface of the brain and on the top (dorsal) of the brain (located around your hairline).

In 2010 a study was conducted using fMRI to show the cooperative involvement of both our PFC and MTL while encoding memories. The results found evidence that these two brain regions hold significant correlations when processing certain memories (Jenkins & Ranganath, 2010). This shows evidence of a strong neural network connecting our PFC and our MTL during sensory exposure, data processing, and encoding for memory.

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